African Journal of Emergency Medicine (2016) 6, 87–93

African Federation for Emergency Medicine

African Journal of Emergency Medicine

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ORIGINAL RESEARCH ARTICLES

Injury patterns and health outcomes among pregnant women seeking emergency medical care in Kumasi, Ghana: Challenges and opportunities to improve care

Types de blessures et résultats pour la santé chez les femmes enceintes ayant besoin d'une prise en charge médicale d'urgence à Kumasi au Ghana: défis et opportunités relatifs à l'amélioration des soins

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Received 23 September 2015; revised 8 December 2015; accepted 4 January 2016; available online 22 February 2016

Introduction: In high-income countries, injury is the most common cause of non-obstetric death among pregnant women. However, the injury risk during pregnancy has not been well characterized for many developing countries including Ghana. Our study described maternal and fetal outcomes after injury at the Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana, and identified associations between the prevalence of poor outcomes and maternal risk factors.
Methods: We conducted a cross-sectional study to identify pregnant women treated for injury over a 12-month period at KATH in Kumasi, Ghana. Descriptive statistics were used to characterize the population. We identified the association between poor outcomes and maternal risk factors using multivariable Poisson regression.
Results: There were 134 women with documented pregnancy who sought emergency care for injury (1.1% of all injured women). The leading injury mechanisms were motor vehicle collision (23%), poisoning (21%), and fall (19%). Assault was implicated in 3% of the injuries. Eleven women (8%) died from their injuries. The prevalence of poor fetal outcomes: fetal death, distress or premature birth, was high (61.9%). One in four infants was delivered prematurely following maternal injury. After adjusting for maternal and injury characteristics, poor fetal outcomes were associated with pedestrian injury (adjusted prevalence ratio (aPR) 2.5, 95% CI 1.5–4.6), and injury to the thoraco-abdominal region (aPR 2.1, 95% CI 1.4–3.3).
Conclusions: Injury is an important cause of maternal morbidity and poor fetal outcomes. Poisoning, often in an attempt to terminate pregnancy, was a common occurrence among pregnant women treated for injury in Kumasi. Future work should address modifiable risk factors related to traffic safety, prevention of intimate partner violence, and prevention of unintended pregnancies.

Introduction: Dans les pays à revenu élevé, les blessures sont la cause la plus fréquente de décès non obstétrical chez les femmes enceintes. Toutefois, le risque de blessure au cours de la grossesse n'a pas été bien caractérisé pour de nombreux pays en développement, dont le Ghana. Notre étude a décrit les résultats maternels et fœtaux après une blessure à l'Hôpital universitaire Komfo Anokye (KATH) à Kumasi au Ghana, et a identifié des liens entre la prévalence de mauvais résultats et les facteurs de risque maternels.
Méthodes: Nous avons mené une étude transversale visant à identifier les femmes enceintes traitées pour des blessures sur une période de 12 mois au KATH, à Kumasi, au Ghana. Des statistiques descriptives ont été utilisées pour caractériser la population. Nous avons identifié le lien entre les résultats médiocres et les facteurs de risques maternels à l'aide d'une régression de Poisson à plusieurs variables.
Résultats: Il existait 134 femmes en état de grossesse documenté ayant nécessité une prise en charge d'urgence pour des blessures (1,1% de toutes les femmes blessées). Les premières causes de blessures étaient les collisions de véhicule (23%), les empoisonnements (21%) et les chutes (19%). Trois pourcent des blessures étaient causées par une agression. Onze femmes (8%) sont décédées des suites de leurs blessures. La prévalence des mauvais résultats fœtaux: le décès du fœtus, des souffrances ou une naissance prématurée, était élevée (61,9%). Un nourrisson sur quatre est né prématurément suite à une blessure maternelle. Après ajustement en fonction des caractéristiques de la mère et des blessures, les mauvais résultats foetaux étaient associés aux blessures occasionnées aux piétons (ratio de prévalence ajusté (RPa) de 2,5, IC 95% 1,5-4,6); et des blessures occasionnées à la région thoraco-abdominale (RPa 2,1 (IC 95% 1,4-3,3)).
Conclusions: Les blessures représentent une cause importante de morbidité maternelle et des mauvais résultats foetaux. L'empoisonnement, souvent subi lors d'une tentative de mettre fin à la grossesse, était un phénomène courant chez les femmes enceintes traitées pour des blessures à Kumasi. Les futurs travaux devraient aborder

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Peer review under responsibility of African Federation for Emergency Medicine.

http://dx.doi.org/10.1016/j.afjem.2016.01.003

les facteurs de risque sur lesquels on peut influer, tels que ceux liés à la sécurité routière, à la prévention de la violence conjugale et à la prévention des grossesses non désirées.

African relevance

- Reduction in maternal mortality rates is an international health priority.
- Little is known about the impact of injury, violence, and poisoning on maternal or fetal outcomes for women living in low- and middle-income countries.
- This study highlights screening for pregnancy among injured women in low- and middle-income countries.

Introduction

In high-income countries, injury is the most common cause of non-obstetric death among pregnant women. In the United States, an estimated one out of 12 pregnant women will experience an injury,[1] and one out of 25 may seek emergency care.[2] Motor vehicle crashes, intimate partner violence and falls are common causes of injury during pregnancy,[3–7] however improvements in seat belt use and traffic safety have reduced the risk of traffic-related injury among pregnant women.[4,8] Elevated risk of maternal mortality from violence (homicide and suicide) extended into the post-partum period in some high-income countries,[9,10] though rates of violence were not elevated in others.[9,11]

Little is known about the impact of injury, violence, and poisoning on maternal or fetal outcomes for women living in low- and middle-income countries (LMICs). Among pregnant women living in LMICs, high risk unintentional injuries such as pedestrian injury may be more common,[12] and the limited use of seat belts and other prevention strategies may increase the risk for vehicle occupants.[13]

There has been limited evaluation of injury-related maternal and fetal deaths during pregnancy in Ghana, where trauma is a leading cause of morbidity and mortality.[22] The objective of this study was to describe maternal and fetal outcomes after trauma at the Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana, and identify any association between the prevalence of poor outcomes and maternal risk factors (i.e. demographic and pregnancy characteristics) and injury characteristics.

Methods

We conducted a cross-sectional study to investigate adverse maternal and fetal outcomes after trauma in Kumasi, Ghana. Medical records for all females 15 years or older who presented to the KATH Emergency Centre (EC) were reviewed to identify women who were recorded as pregnant at the time of presentation after injury.

The primary outcomes were maternal death and poor fetal outcome – defined as fetal distress, premature birth, still birth, or fetal death. Covariates included maternal socio-demographic characteristics (i.e. age, ethnicity, religion, marital status, education, insurance status, geographical region of residence, employment, and reported alcohol or drug use by partner), pregnancy and family characteristics (i.e. gravidity, estimated gestational age, and number of live children), and injury characteristics (i.e. mechanism, intent, and location of injury).

Descriptive statistics were compiled for exposures and outcomes of interest. Data ascertainment was mostly complete with the exception of partner alcohol/drug use (53% missing) and intent (0.8% missing). Missing data were noted in result tables when missingness exceeded 5%. Maternal alcohol/drug use was rarely recorded in the medical chart. Pearson's chi-square test was used to assess whether observed differences between groups arose by chance, and the Fisher exact test was used in cases where a single data cell had fewer than five observations. Bivariate and multivariable Poisson regression with robust standard errors were used to determine prevalence ratios given that outcomes were relatively frequent (8.2% and 61.9% of study population with poor maternal and fetal outcomes, respectively). Multivariable model covariates were chosen based on statistical significance in bivariate analysis and/or known associations based on review of the relevant literature. Covariates considered were maternal age, ethnicity, marital status, maternal education, insurance status, gestational age, number of living children, location of injury, injury mechanism, and anatomical location of injury.

All data were analyzed with STATA version 12.1 (College Station, TX). The study was approved by the Committee for Human Research, Publications and Ethics (CHRPE) of the Kwame Nkrumah University of Science and Technology in Kumasi/Komfo Anokye Teaching Hospital, Ghana and the Institutional Review Board of the University of Washington in Seattle, USA.

Results

A total of 29,165 charts were reviewed. Of the total number reviewed, 11,764 (40.3%) patients were women, of which 134 (1.1%) had documented evidence of pregnancy. Maternal demographic, fetal, and injury characteristics of this population are presented in Table 1.

Most injured pregnant women were between 18 and 35 years of age (81.3%); only 3% were younger than 18. Nearly three out of four injured females were married (71.6%), and most (79.1%) had health insurance. Most women (62.0%) had completed junior secondary education or higher, though 13.4% reported no formal education.

Among the injured women, the most common mechanisms of injury were traffic-related (35.1%), with vehicle vs. pedestrian collisions accounting for 12.7% of injuries, and bus or private vehicle collisions accounting for 22.4%. The second most common cause of injury was poisoning (20.9%). Fourteen percent of pregnant women evaluated required emergency care for a laceration or penetrating wound. In this study, the